CONLEY
ASSOCIATES

Memorandum

To: Mr. Glenn Berger

From: Mr. Brian J. Beisel

Date: June 21, 2006

Re: Exchange Hall Redevelopment

Conley Associates, Inc. has assessed the traffic impacts associated with the proposed redevelopment of Exchange Hall in our Traffic Impact Study (TIS) dated February 2006. The proposed redevelopment calls for the existing building to be renovated into a restaurant and a function hall. At the time of the TIS, the restaurant was planned to have 175 seats and the function hall would seat an additional 200 people. However, the function hall portion of the redevelopment has now been modified to include seating for 225 people. Also, the on site parking has been modified to include 21 parking spaces on site, in addition to the 25 parking spaces across School Street for a total of 46 parking spaces. Based on the South Acton Village District parking regulations, the proposed redevelopment would now require a total of approximately 100 parking spaces, 54 of which will be provided at the South Acton MBTA Commuter Rail Station Parking Lot (MBTA Lot)

The outbound train schedule for the South Acton MBTA Commuter Rail Station was reviewed during the February 2006 TIS. It was determined that outbound trains arrive at the station at 3:55 PM, 4:45 PM, 5:20 PM, 5:45 PM, 6:10 PM, and 6:28 PM.

Conley Associates, Inc. determined the parking availability at the MBTA parking lot during the weekday PM peak period of 5:00 PM to 7:00 PM. There are a total of 268 parking spaces at the MBTA Parking Lot. A parking survey conducted by Conley Associates, Inc. on February 3, 2006. The survey started after the 5:20 train riders had left the parking lot. The survey of the occupied and available parking spaces at this time (approximately 5:30 PM) showed that there were 91 vacant parking spaces. As expected, the number of available parking spaces increased throughout the evening until the survey concluded. The survey concluded after the 6:28 train riders had exited the parking lot (approximately 6:35 PM). At this time, 203 of the 268 parking spaces were vacant and available.

The data of the parking survey shows that as of approximately 5:00 PM there are enough vacant spaces at the MBTA Parking Lot to meet the demand of the proposed redevelopment, as well as meet the South Acton Village District parking regulations. Although Conley Associates, Inc. did not perform a parking survey during a Saturday, typically commuter station parking lots are less occupied during the course of the weekday than during the weekday PM peak hour. Therefore, it is expected that the MBTA Parking Lot will have enough available parking spaces during the Exchange Hall Saturday peak operating hours to match the demand of the facility, as well as the South Acton Village District parking regulations.

Z:\PROJECTS\1267 Exchange Hall Acton\Docs\1267 Memo 2006-06-21.doc

214 Cambridge Street, Boston, MA 02114 (617) 742-5111
349 Lakewood Drive, Killington, VT 05751 (802) 345-2321
Fax: (617) 742-5333 www.ConleyAssociates.com

CONLEY
ASSOCIATES

TRAFFIC IMPACT STUDY

EXCHANGE HALL
ACTON, MASSACHUSETTS

FEBRUARY 2006

214 Cambridge Street, Boston, MA 02114 (617) 742-5111
349 Lakewood Drive, Killington, VT 05751 (802) 345-2321
Fax: (617) 742-5333 www.ConleyAssociates.com

Conley Associates, Inc. has assessed the traffic impacts associated with the proposed redevelopment of Exchange Hall. The proposed redevelopment calls for the existing building to be renovated into a restaurant and function hall. The site is located on the northeast corner of the intersection of Main Street (Route 27) at School Street in Acton, Massachusetts. Two driveways, a full access driveway on School Street and a right turn exit only driveway on Main Street will provide access to the site. The redevelopment will consist of a restaurant with seating for 175 people and a function hall with seating for 200 people. The study area will consist of the intersections of Main Street at Central Street, Main Street at School Street and Railroad Street, School Street at the Main Site Driveway, Central Street at the MBTA Parking Lot Driveway, and School Street at the MBTA Overflow Parking Driveway.

The weekday PM peak period (4:30 to 6:30 PM) was studied in order to obtain a realistic assessment of the traffic impact of the proposed redevelopment. The typical weekday PM peak period is from 4:00 to 6:00 PM, however, since the proposed redevelopment is expected to have its peak usage at later than the typical commuter peak hours, the peak period was slightly adjusted. The later peak period coincided with the peak arrival of trains at the South Acton MBTA Commuter Rail Station. Table 1 shows the MBTA weekday commuter peak period outbound schedule.

Table 1: MBTA Weekday Outbound Schedule

Departs North Station	3:00	4:00	4:40	4:50	5:20	5:30
Arrives at South Acton	3:55	4:56	5:20	5:45	6:10	6:28

As shown in Table 1, the majority of the weekday peak period trains arrive between 4:30 and 6:30 PM. In addition to a typical weekday (Tuesday, Wednesday, Thursday), Conley Associates, Inc. assessed the Friday PM peak hour as well. The redevelopment is expected to experience peak patronage on a Friday evening instead of a typical weekday.

Existing Condition

The existing transportation conditions of the study area were assessed in January of 2006. Existing roadway geometrics, existing study area traffic volumes, and monthly traffic volume variations were collected.

Roadway Geometrics

The roadway geometrics were obtained during a site visit conducted by Conley Associates, Inc. staff in January 2006. Main Street runs north and south through the study area. It is typically one lane in each direction separated by a double yellow centerline.

Central Street approaches Main Street from the northwest to form a skewed three way unsignalized intersection. Central Street consists of one lane for left and right turn movements onto Main Street.

The intersection of Main Street at School Street and Main Street at Railroad Street and the Exit Site Driveway are two closely spaced intersections. These intersections are signalized through one controller and the movements at each intersection are coordinated with the movements at the other intersection. School Street approaches Main Street from the east and Railroad Street approaches Main Street from the west. School Street is south of the Exit Site Driveway. The Exit Site Driveway, which will be signed as right turn only in the future, approaches Main Street from the northeast. The Railroad Street approach and the Exit Site Driveway approach only obtain a green phase when there are vehicles on these approaches. In most cases the intersection acts as a three way intersection with Main Street and School Street as the major approach legs.

The South Acton MBTA Commuter Rail Station has one main parking area. This parking area consists of both resident permit parking spaces and metered parking spaces. Access to this parking lot is via Central Street. The Parking Lot Driveway approaches Central Street from the south to form a three way unsignalized intersection.

Currently, a parking area located to the south of School Street is also used for MBTA parking. The Overflow Parking Lot Driveway approaches School Street from the south to form a three way unsignalized intersection.

Traffic Data Collection

Turning movement counts (TMCs) were performed at the study area intersections. The TMCs were conducted on Wednesday, January 25, 2006 and Friday, January 27, 2006 during the weekday PM peak period.

The count data shows that the weekday PM peak hour occurred from 4:45 to 5:45 PM when approximately 1,770 vehicles traveled along Main Street with approximately 830 traveling northbound and 940 vehicles traveling in the southbound direction. During the Friday PM peak hour, which occurred from 4:45 to 5:45, approximately 1,620 vehicles traveled along Main Street with 745 vehicles traveling northbound and 875 traveling in the southbound direction.

Seasonal Adjustment

In order to determine the seasonal variation in the traffic volumes in this area, Conley Associates, Inc. researched local traffic count data from MassHighway. Continuous counting data were taken from the closest permanent count stations #403 located on Route 2 east of the Concord Rotary, in Concord, Massachusetts and count station #4172 west of Route 27 in Acton, Massachusetts. The data indicates that January traffic volumes are approximately seven percent lower than the average month volume. Therefore, the weekday PM and Friday PM traffic volumes collected were adjusted seven percent to represent average month conditions.

Existing Traffic Volumes

The raw traffic volumes were seasonally adjusted and balanced to determine the 2006 Existing condition. The 2006 Existing weekday PM and Friday PM peak hour traffic volumes can be found in the Appendix.

No Build Condition

The transportation conditions expected in the study area in 2011 without the proposed project in place were determined. Background traffic growth was projected and site specific traffic was researched. The traffic associated with each of these components was added to the 2006 Existing traffic volumes to determine the 2011 No Build condition.

Background Traffic Growth

Conley Associates, Inc. researched traffic growth rates for the Town of Acton. MassHighway count stations in Acton were researched, specifically #4001, Route 27 north of Route 2A; #4002, Route 2A at Route 119; #4167 School Street west of Parker Street; and #4172 Route 2 west of Route 27. Based on this data, traffic volumes have grown at an average rate of approximately 0.39 percent per year. However, since station #4001 located near the study area increased by nearly two percent per year, Conley Associates, Inc. determined a two percent growth rate per year to be appropriate for the study area.

Site Specific Development

Conley Associates, Inc. contacted the Town of Acton Planning Board in order to determine if there were any permitted projects that would impact traffic volumes in the study area. The Town indicated that a 30 unit apartment complex is under development on High Street.

No Build Traffic Volumes

The 2006 Existing traffic volumes were increased by two percent per year compounded for five years and the traffic associated with the site specific development was added in order to determine the 2011 No Build condition. The 2011 No Build weekday PM and Friday PM peak hour traffic volumes can be found in the Appendix.

Build Condition

The 2011 Build condition for the study area was determined. As indicated previously, the proposed redevelopment of the site will consist of a restaurant with seating for 175 people and a function hall with seating for 200 people. The trip generation for the site was determined, distributed to area roadways, and added to the 2011 No Build condition to determine the 2011 Build condition.

Trip Generation

Conley Associates, Inc. performed trip generation analysis for the proposed site during the weekday PM peak hour using industry standards as well as locally collected data. On a typical

weekday, it is expected that the proposed function hall will operate in a similar fashion to a restaurant with potentially a variety of smaller events. Conley Associates, Inc. researched the available data contained in the Institute of Transportation Engineer's (ITE) publication Trip Generation, 7th Edition, to determine the trip generation of the proposed redevelopment during the weekday PM peak hour. Specifically, Land Use Codes (LUC) 932, High Turnover (Sit Down) Restaurant for the restaurant space and LUC 931, Quality Restaurant for the function hall were utilized to determine the trip generation of the proposed redevelopment.

Conley Associates, Inc. determined the Friday PM peak hour assuming a 200 seat event in the function hall starting during the adjacent street peak hour. With an estimated Vehicle Occupancy Rate (VOR) of 2.0 attendees per vehicle the function space is estimated to generate 100 vehicle trips. A detailed summary of the expected trip generation for the proposed site is detailed in Table 2.

Table 2: Trip Generation Summary

	Restaurant[1]	Function Hall[2]	Total
Weekday PM Peak Hour			
In	43	35	78
Out	31	17	48
Total	74	52	126

	Restaurant[1]	Function Hall[3]	Total
Friday PM Peak Hour			
In	43	100	143
Out	31	0	31
Total	74	100	174

1. Based on Trip Generation, 7th Edition, published by Institute of Transportation Engineers, 2003, specifically Land Use Code 932, High Turnover (Sit Down) Restaurant. Assumes seating for 175 people.
2. Based on Trip Generation, 7th Edition, published by Institute of Transportation Engineers, 2003, specifically Land Use Code 931, Quality Restaurant. Assumes seating for 200 people.
3. Assumes 200 person event starting during the adjacent street peak hour and a Vehicle Occupancy Rate of 2.0.

As shown in Table 2, the proposed redevelopment is expected to generate a total of 126 vehicle (78 trips in and 48 trips out) during the weekday PM peak hour. During the Friday PM peak, assuming the worst case scenario that a function starts during the adjacent street peak hour, the proposed redevelopment is expected to generate a total of 174 vehicle trips (143 trips in and 31 trips out).

Trip Distribution

The traffic generated by the proposed redevelopment was distributed through the study area based on the existing traffic volume patterns. During the weekday PM peak hour, 25 percent of the trips will be oriented to and from the north along Main Street and 47 percent of the trips are expected to be oriented to and from the south along Main Street. The remaining 28 percent of

the trips are expected to be distributed along Central Street and School Street with 14 percent of the trips traveling to and from each Central Street and School Street.

Build Traffic Volumes

The expected site related traffic volumes were added to the 2011 No Build traffic volumes to determine the 2011 Build condition. The 2011 Build weekday PM and Friday PM peak hour traffic volumes can be found in the Appendix.

Traffic Operations Analysis

The traffic operations of the study area intersections were determined. Analysis was based on methodologies outlined in the Highway Capacity Manual. Level of service and delays were calculated and are summarized below.

Level of Service

Level of service (LOS) is a calculation of control delay for an intersection. LOS is an indication of driver discomfort, frustration, fuel consumption, and lost time. LOS is defined by an index from A (free flow) to F (long delays). LOS control delay values are given in Table 3.

Signalized intersection analysis is based upon the capacity of each lane and the correlating delay associated with the intersection. Capacity is a measurement of the ability of an intersection design to accommodate all movements within the intersection. Delay is the measure of the user quality of service. Capacity is a function of physical geometry and signalization conditions.

For unsignalized intersections, delay values apply only to the controlled movements, since the main street movements are not restricted. Control delay is the elapsed time for deceleration, queue time, stopped delay, and final acceleration. Average control delay for unsignalized intersections is a function of the capacity of the approach and the degree of saturation.

Table 3: Intersection Level of Service Criteria

Level of Service	Average Delay (seconds)	
	Unsignalized Intersections	Signalized Intersections
A	≤ 10	≤ 10
B	>10 and ≤ 15	>10 and ≤ 20
C	>15 and ≤ 25	>20 and ≤ 35
D	>25 and ≤ 35	>35 and ≤ 55
E	>35 and ≤ 50	>55 and ≤ 80
F	>50	>80

Source: 2000 Highway Capacity Manual

Intersection Operating Conditions

The level of service procedures described above was used to determine peak hour operating levels of service at the study area intersections. Table 4 shows the LOS and average delay per vehicle at the study area intersection.

Table 4: Level of Service Summary

	Existing		No Build		Build	
Unsignalized Intersections	**LOS[1]**	**Delay[2]**	**LOS**	**Delay**	**LOS**	**Delay**
Main Street at Central Street						
Weekday PM Peak Hour	D	29.5	F	59.6	F	>100
Friday PM Peak Hour	F	52.1	F	>100	F	>100
Central Street at the MBTA Parking Lot Driveway						
Weekday PM Peak Hour	C	15.9	C	17.7	C	18.2
Friday PM Peak Hour	C	16.3	C	17.8	C	18.5
School Street at the Overflow Parking Lot Driveway						
Weekday PM Peak Hour	B	11.1	B	11.5	B	11.7
Friday PM Peak Hour	B	11.3	B	11.7	B	11.9
School Street at the Main Site Driveway						
Weekday PM Peak Hour	N/A	N/A	N/A	N/A	B	11.3
Friday PM Peak Hour	N/A	N/A	N/A	N/A	B	11.9
	2006 Existing		**2011 No Build**		**2011 Build**	
Signalized Intersections	**LOS[1]**	**Delay[2]**	**LOS**	**Delay**	**LOS**	**Delay**
Main Street at School Street						
Weekday PM Peak Hour	B	14.7	C	23.3	D	39.9
Friday PM Peak Hour	B	17.1	C	29.2	D	47.1
Main Street at Railroad Street and Exit Site Driveway						
Weekday PM Peak Hour	A	3.8	A	5.9	A	8.1
Friday PM Peak Hour	A	5.0	A	6.6	A	8.8

1. LOS = Level of Service.
2. Delay is measured in seconds per vehicle.

As shown in Table 4, the proposed site is expected to increase delay at the signalized intersection of Main Street at School Street by approximately 16 seconds per vehicle during the weekday PM peak hour and approximately 18 seconds during a worst case scenario Friday PM peak hour. All of the study area intersections are currently experiencing acceptable Levels Of Service except for the Central Street approach to the intersection of Main Street. In addition, all of the study area intersections are expected to continue to operate at acceptable Levels of Service in the 2011 Build conditions with the same exception of Central Street approaching Main Street. The Site Driveway approach to School Street is expected to operate at LOS B during the weekday PM and the Friday PM peak hour.

Parking Survey

Conley Associates, Inc. conducted a parking survey on Friday, February 3, 2006 at the MBTA parking lot. The MBTA weekday outbound train schedule was researched and it was determined that the peak period for spaces to become vacant is between 5:00 PM and 6:30 PM. Table 5 shows the parking spaces occupied and available after each train arrived at the station.

Table 5: Parking Survey

268 Total Spaces	Occupied	Vacant	Number of Parkers on Train
Train arrives at 5:20 PM			
Parking Survey at 5:30 PM	177	91	
Train Arrived at 5:45 PM			14
Parking Survey at 5:55 PM	163	105	
Train Arrived at 6:10 PM			64
Parking Survey at 6:20 PM	99	169	
Train Arrived at 6:28 PM			34
Parking Survey at 6:35 PM	65	203	

As shown in Table 5, trains are scheduled to arrive at 5:20, 5:45, 6:10, and 6:28 PM. After the 5:20 train riders have exited the parking lot there are approximately 91 vacant spaces at 5:30 PM. At 6:30 PM, after the 6:28 train riders have exited the parking lot, there are approximately 200 empty parking spaces.

Conclusion

As shown, the signalized intersections of Main Street at School Street and Main Street at Railroad Street are expected to operate at acceptable Levels of Service with the proposed redevelopment in place. The proposed redevelopment is expected to generate 126 vehicle trips during a typical weekday PM peak hour. During a worst case scenario when an event in the function hall begins during the adjacent street peak hour, the redevelopment is expected to increase delay along Main Street by approximately 18 seconds per vehicle.